AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 4042C

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ALUMINUM ALLOY SHEET, ALUMINUM COVERED
4.5Cu - 1.5Mg - 0.6Mn (Alo 24S-T36)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for formed structural parts of good strength which are required to exhibit maximum corrosion resistance and to match the color and appearance of other clad aluminum alloy parts.

3. COMPOSITION:

Core		Cladding	
Copper	3.8 - 4.9	Iron + Silicon	0.7 max
Magnesium	1.2 - 1.8	Copper	0.10 max
Manganese	0.30 - 0.9	Zinc	0.10 max
Iron	0.5 max	Manganese	0.05 max
Silicon	0.5 max	Aluminum, by difference	99.3 min
Chromium	0.10 max		
Zinc	0.10 max		
Other Impurities, each	0.05 max		
Other Impurities, total	0.15 max		
Aluminum	remainder		

3.1 When the analysis is made on a sample milled from the material representative of the entire cross section, the percentage of the various elements as determined by analysis, except aluminum, shall be increased by 11% for thicknesses under 0.064 in. and 5% for thicknesses 0.064 in. and over, and these figures shall be taken as the composition of the base metal.

4. CONDITION: Solution heat treated and cold worked.

5. TECHNICAL REQUIREMENTS:

5.1 Cladding Thickness:

5.1.1 Prior to Rolling: Aluminum plates which are bonded to the alloy ingot or slab preparatory to rolling to the specified thickness of the composite material shall each have a thickness of not less than 5% of the total composite thickness for material having a finished thickness less than 0.064 in. and not less than 2.5% for material having a finished thickness of 0.064 in. and over.

5.1.2 Finished Product: After rolling, the average cladding thickness shall be not less than 80% of the values specified above.

5.2 Tensile Properties: Test specimens shall conform to ASTM E8 except from material less than 3/4 in. wide, and shall be cut across the direction of rolling except from material less than 9 in. wide. Elongation requirements apply only to material 3/4 in. and over in width.

Nominal Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated		Elongation % in 2 in.
		psi, min	Extension Under Load inch in 2 in.	
0.020 - 0.031, incl	62,000	48,000	0.0142	8
Over 0.031 - 0.040, incl	62,000	48,000	0.0142	9
Over 0.040 - 0.063, incl	62,000	48,000	0.0142	10
Over 0.063 - 0.188, incl	66,000	50,000	0.0140	10
Over 0.188 - 0.249, incl	66,000	50,000	0.0140	9

5.2.1 Extension under load is based on E = 9,500,000 psi for material 0.063 in. and under in thickness and on E = 10,000,000 psi for material over 0.063 in. to 0.249 in. thick.

5.3 Bending: Material shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the bend factor shown below times the nominal thickness of the material, with axis of bend parallel to direction of rolling.

Nominal Thickness Inch	Bend Factor
0.020 - 0.040, incl	4
Over 0.040 - 0.063, incl	5
Over 0.063 - 0.128, incl	6
Over 0.128 - 0.249, incl	8

6. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2202 as applicable. Thickness tolerances shall conform to Table II.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the chemical composition and tensile properties of the material conform to the requirements specified. This report shall include the purchase order number, material specification number, thickness, size, and quantity. When material is Government source inspected, reports will not be required.

8.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.